CCN # 139510
File B.8

R10901101

AREVA

AFS-08-0085

April 23, 2008

RPP-WTP
RECEIVED
APR 30 2008
BY PDC

Ms. Jean Renner
Subcontracts
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Ms. Renner:

BECHTEL NATIONAL, INC. CONTRACT NO. 24590-CM-HC4-HXYG-00211 - STRUCTURAL INTEGRITY ASSESSMENT OF LOW-ACTIVITY WASTE (LAW) PRIMARY OFFGAS SYSTEM (LOP) PLANT ITEMS (LOP-VSL-00001/2), (LOP-SCB-00001/2), and (LOP-WESP-00001/2) (AREVA-IA-103, REV. 0)

The integrity assessment of the subject Plant Items has been completed per the contract requirements and is enclosed for your use. The assessment found that the design is sufficient to ensure that each Plant Item is adequately designed and has sufficient structural strength, compatibility with the waste(s) to be processed/stored/treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

If you have any questions, please contact Tarlok Hundal at (509) 373-4438, or via email at tarlok.hundal@areva.com.

Sincerely,

Mark D. Rickenbach
Director, Technical Services
AREVA Federal Services LLC
Richland Office

Enclosure

cc: D. C. Pfluger, MS5-L w/enclosure (2)

AREVA Federal Services LLC

2425 Stevens Center Place, Richland, WA 99354, P.O. Box 840, Richland, WA 99352
Tel.: 509 372 8256 - Fax: 509 372 3169 - www.areva.com

STRUCTURAL INTEGRITY ASSESSMENT OF LOW-ACTIVITY WASTE (LAW) PRIMARY OFFGAS PROCESS SYSTEM (LOP) PLANT ITEMS (LOP-VSL-00001/2), (LOP-SCB-00001/2), and (LOP-WESP-00001/2)

Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.

IQRPE REVIEW
OF
LOW-ACTIVITY WASTE (LAW) PRIMARY OFFGAS PROCESS SYSTEM (LOP)
PLANT ITEMS
(LOP-VSL-00001/2), (LOP-SCB-00001/2), and (LOP-WESP-00001/2)

"I, Tarlok Hundal have reviewed, and certified a portion of the design of a new tank system or component located at the Hanford Waste Treatment Plant, owned/operated by Department of Energy, Office of River Protection, Richland, Washington. My duties were independent review of the current design for the Low-Activity Waste (LAW) Primary Offgas Process System (LOP) Plant Items (LOP-VSL-00001/2), (LOP-SCB-00001/2), and (LOP-WESP-00001/2) as required by the Washington Administrative Code, *Dangerous Waste Regulations*, Section WAC-173-303-640(3) (a) through (g) applicable components."

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

The documentation reviewed indicates that the design fully satisfies the requirements of the WAC.

The attached review is twenty-one (21) pages numbered one (1) through twenty-one (21).

EXPIRES: 02/15/10

T S Hundal
Signature

4/23/08
Date

Scope	Scope of this Integrity Assessment	This Integrity Assessment includes the following LOP System plant items including their appurtenances are located at Elevation 2'-0" in cells L-0123 and L-0124 of the LAW Vitrification Building as shown on plant general arrangement Drawing 24590-LAW-P1-P01T-00002: 1. Two Melter Submerged Bed Scrubber Condensate Vessels (LOP-VSL-00001/2)--pages 4 thru 9. 2. Two Submerged Bed Scrubbers (LOP-SCB-00001/2)--pages 10 thru 15. 3. Two Wet Electrostatic Precipitators (LOP-WESP-00001/2)--pages 16 thru 21.
References	Material Requisitions and Specifications	Material Requisitions (MRs): 24590-QL-MRD-MVA0-00002, Rev. 2 (including Supplement Nos. S0014 and S0018 to Rev. 2), Pressure Vessels, High Alloy , Shop Fabricated, Medium QL-1 (N116) for Condensate Vessels 24590-QL-MRA-MKAS-00001, Rev. 6, Submerged Bed Scrubbers, Flue or Off-Gas LAW QL-1 (N083) (QOL1). 24590-QL-MRA-MKE0-00001, Rev. 6 (including Supplement No. S007 to Rev. 6), Wet Electrostatic Precipitators (WESP) QL1/2 (QOL5) (MLT001). Specifications: The following Specifications with their respective revision and Specification Change Notices (SCNs) are listed in the above listed Material Requisitions: 24590-WTP-3PS-MV00-T0001, Engineering Specification for Pressure Vessel Design and Fabrication; 24590-WTP-3PS-MV00-T0002, Engineering Specification for Seismic Qualification Criteria for Pressure Vessels; 24590-WTP-3PS-MV00-T0003, Engineering Specification for Pressure Vessel Fatigue Analysis; 24590-WTP-3PS-MVB2-T0001, Engineering Specification for Welding of Pressure Vessels, Heat Exchangers, and Boilers; 24590-WTP-3PS-M000-T0002, General Specification for Mechanical Handling, Equipment Design, and Manufacture; 24590-WTP-3PS-G000-T0001, General Specification for Supplier Quality Assurance Program Requirements; 24590-WTP-3PS-G000-T0002, Engineering Specification for Positive Material Identification (PMI); 24590-WTP-3PS-G000-T0003, Engineering Specification for Packaging, Handling, and Storage Requirements; 24590-WTP-3PS-MKE0-T0001, Engineering Specification for Wet Electrostatic Precipitators (WESPs); 24590-WTP-3PS-FB01-T0001, Engineering Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks.
Summary of Assessment		For each item of "Information Assessed" (i.e., Criteria) on the following pages, the items listed under "Source of Information" were reviewed and found to furnish adequate design controls and requirements to ensure that the design fully satisfies the requirements of Washington Administrative Code, WAC-173-303-640, *Dangerous Waste Regulations* for Tank Systems.

References (cont'd)	Drawings	Plant Drawings including Drawing Change Notices (DCNs) listed in the above listed Material Requisitions: 24590-LAW-P1-P01T-00002, Rev. 5, LAW Vitrification Building General Arrangement Plan at El. 3'-0"; 24590-LAW-P1-P01T-00007, Rev. 8, LAW Vitrification Building General Arrangement Section A-A, B-B, C-C, and S-S; 24590-LAW-P1-P01T-00010, Rev. 8, LAW Vitrification Building General Arrangement Section K-K, L-L, and M-M; 24590-LAW-M6-LOP-00001, Rev. 4, P & ID-LAW Primary Offgas Process System Melter 1; 24590-LAW-M6-LOP-00002, Rev. 4, P & ID-LAW Primary Offgas Process System Melter 2. 24590-LAW-M5-V17T-P0007, Rev. 0, Process Flow Diagram LAW Melter 1 Primary Offgas Treatment System (System LOP); 24590-LAW-M5-V17T-P0008, Rev. 0, Process Flow Diagram LAW Melter 2 Primary Offgas Treatment System (System LOP); Vendor Fabrication Drawings (* Bechtel Code 1, 2, or 4 Drawings): 24590-QL-POB-MVA0-00002-01-01, Rev. 00I, LAW Melter 1 SBS Condensate Vessel (LAW-LOP-VSL-00001); 24590-QL-POB-MVA0-00002-01-02, Rev. 00J, LAW Melter 1 SBS Condensate Vessel (LAW-LOP-VSL-00001); 24590-QL-POB-MVA0-00002-01-03, Rev. 00J, LAW Melter 2 SBS Condensate Vessel (LAW-LOP-VSL-00002); 24590-QL-POB-MVA0-00002-01-04, Rev. 00K, LAW Melter 2 SBS Condensate Vessel (LAW-LOP-VSL-00002); 24590-QL-POA-MKAS-00001-01-01, Rev. 00G, Submerged Bed Scrubber Assembly Drawing (LAW-LOP-SCB-00001/2); 24590-QL-POA-MKAS-00001-01-10, Rev. 00G, Submerged Bed Scrubber General Notes (LAW-LOP-SCB-00001/2); 24590-QL-POA-MKE0-00001-06-01, Rev. 00C, LAW-1 WESP Vessel Assembly, LOP-WESP-00001; 24590-QL-POA-MKE0-00001-06-02, Rev. 00C, LAW-1 WESP Vessel Assembly, LOP-WESP-00001; 24590-QL-POA-MKE0-00001-06-03, Rev. 00G, LAW-1 WESP Vessel Subassembly, LOP-WESP-00001; 24590-QL-POA-MKE0-00001-06-04, Rev. 00G, LAW-1 WESP Vessel Details, LOP-WESP-00001; 24590-QL-POA-MKE0-00001-06-06, Rev. 00G, LAW-1 WESP Vessel Details, LOP-WESP-00001 (including S001); 24590-QL-POA-MKE0-00001-06-13, Rev. 00C, LAW-2 WESP Vessel Assembly, LOP-WESP-00002; 24590-QL-POA-MKE0-00001-06-14, Rev. 00C, LAW-2 WESP Vessel Assembly, LOP-WESP-00002; 24590-QL-POA-MKE0-00001-06-15, Rev. 00G, LAW-2 WESP Vessel Subassembly, LOP-WESP-00002 (including S001); 24590-QL-POA-MKE0-00001-06-16, Rev. 00G, LAW-2 WESP Vessel Details, LOP-WESP-00002; 24590-QL-POA-MKE0-00001-06-18, Rev. 00G, LAW-2 WESP Vessel Details, LOP-WESP-00002; 24590-QL-POA-MKE0-00001-06-33, Rev. 00H, P & ID LAW-WESP, LOP-WESP-00001; 24590-QL-POA-MKE0-00001-06-00049, Rev. 00F, P & ID LAW-WESP, LOP-WESP-00002. * Bechtel Code 1 Drawing is an "as fabricated vendor drawing" approved/accepted by Bechtel. Bechtel Code 2 Drawing is an "as fabricated vendor drawing" approved (with comments)/accepted by Bechtel. Bechtel Code 4 Drawing is an "as fabricated vendor drawing" approved/accepted by Bechtel without review.

References (cont'd)	Mechanical Data Sheets and System Description	Mechanical Data Sheets: 24590-LAW-MVD-LOP-00004, Rev. 5, LAW Melter 1 SBS Condensate Vessel (LOP-VSL-00001); 24590-LAW-MVD-LOP-00005, Rev. 5, LAW Melter 2 SBS Condensate Vessel (LOP-VSL-00002); 24590-LAW-MKD-LOP-00008, Rev. 1, LAW Melter 1/2, Submerged Bed Scrubber (LOP-SCB-00001/2). System Description: 24590-LAW-3YD-LOP-00001, Rev. 1, System Description for LAW Primary Offgas Process (LOP) and LAW Secondary Offgas/Vessel Vent Process (LVP) Systems (including SDCN 00006 to Rev. 1)

	Information Assessed	Source of Information	Assessment
Design	Vessel design standards are appropriate and adequate for the vessel's intended use.	Mechanical Data Sheets, Specifications, and Drawings, listed above under References; ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers.	The Mechanical Data Sheets show that the LAW LOP system Melter 1 and Melter 2 SBS Condensate Vessels, LOP-VSL-00001/2 and their appurtenances are to be designed to the ASME Section VIII, Division 1 rules which are appropriate for pressure vessels operating with mixed waste solutions over the pressure and temperature ranges specified for these vessels. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure vessel, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the vessel and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These are adequate and acceptable design standards for the intended use of the vessels. The drawings show that the LOP-VSL-00001/2 are vertical with a 144 in. ID and a height of 98 in. from the bottom tangent line to the top tangent line. The vessels' top and bottom Flanged & Dished (F & D) heads and shells are built with 5/8" thick plate. Each vessel is supported on a cylindrical skirt (1/2" thick plate by approx. 28" high) which in turn is supported on a base plate anchored to the concrete floor at Elev. 2'-0". Each vessel has internal equipment such as an eductor, spay nozzle, and piping that are supported from the vessel's top head. Material for the shell, top and bottom heads, and vessel's internal equipment is Hastelloy C-22 (SB-575 N06022) and is hereafter referred to as C-22. Each vessel's shell and bottom head has an external cooling coil jacket made of SA-312 304 stainless steel half-pipe section and the supporting skirt is specified as SA-240 304 stainless steel plate. Both of these aforementioned stainless steel components have a 0.030% maximum carbon content and this material is hereafter referred to as the 304 stainless steel. The operating volume of each vessel is about 7,400 gallons and the total internal volume is about 9,050 gallons.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.	Mechanical Data Sheets, Material Requisition, and Drawings listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-QL-POB-MVA0-00002-03-01, Rev. 00E, Design Calculations for LOP-VSL-00001; 24590-QL-POB-MVA0-00002-03-09, Rev. 00C, Design Calculations for LOP-VSL-00001; 24590-QL-POB-MVA0-00002-03-11, Rev. 00C, Design Calculations for LOP-VSL-00001; 24590-QL-POB-MVA0-00002-03-02, Rev. 00E, Design Calculations for LOP-VSL-00002; 24590-QL-POB-MVA0-00002-03-10, Rev. 00C, Design Calculations for LOP-VSL-00002; 24590-QL-POB-MVA0-00002-03-12, Rev. 00C, Design Calculations for LOP-VSL-00002;	The LOP Melter 1 and Melter 2 SBS Condensate Vessels, LOP-VSL-00001/2 are standard ASME Section VIII, Div. 1 vessels. The Mechanical Data Sheets require that the ASME Section VIII, Division 1 vessels be delivered after design, fabrication, inspection, and testing with an ASME code stamp and that the vessels be nationally registered. These are shop fabricated vessels that are delivered for service in the LAW Facility. Review of the Design Calculations documents of these vessels show that the vessels have been designed as standard vessels per applicable requirements of ASME Section VIII, Division 1 Code and other documents listed in the Material Requisition for the vessels. The aforementioned statements and the vendor fabrication drawings reviewed demonstrate that sound engineering principles of construction and fabrication have been used for the vessels.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Vessel has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Mechanical Data Sheets, Specifications, and Material Requisition, listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; UBC 1997, Uniform Building Code, International Conference of Building Officials; 24590-QL-POB-MVA0-00002-03-01, Rev. 00E, Design Calculations for LOP-VSL-00001; 24590-QL-POB-MVA0-00002-03-09, Rev. 00C, Design Calculations for LOP-VSL-00001; 24590-QL-POB-MVA0-00002-03-11, Rev. 00C, Design Calculations for LOP-VSL-00001; 24590-QL-POB-MVA0-00002-03-02, Rev. 00E, Design Calculations for LOP-VSL-00002; 24590-QL-POB-MVA0-00002-03-10, Rev. 00C, Design Calculations for LOP-VSL-00002; 24590-QL-POB-MVA0-00002-03-12, Rev. 00C, Design Calculations for LOP-VSL-00002.	The Mechanical Data Sheets identify each vessel's operating pressure and temperature ranges, the materials selected for the vessel, the corrosion allowance, the vessel quality level, and its seismic category. The Mechanical Data Sheets also require that the vessels be designed to ASME Section VIII, Division 1 rules. This code requires specific consideration of the operating pressures, temperatures, seismic loads, and corrosion allowance in the design process. Supplementary design criteria are specified in the Engineering Specifications for Seismic Qualification Criteria and Structural Design Loads for Seismic Category III & IV Equipment and Tanks to provide for the seismic design analysis. The Mechanical Data Sheets identify the vessels operating pressure and temperature ranges and the requirements for seismic qualification in the design. ASME Section VIII, Div. 1 requires that corrosion allowance thickness shall be excluded from nominal vessel thickness when evaluating the adequacy of vessel components for these loads at end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels provides pertinent requirements for determination of seismic loads, analysis, and acceptance criteria for the vessels and their supports. The Mechanical Data Sheet identifies the vessels' Seismic Category as SC- III. For SC-III vessels, the detailed requirements for seismic load determination (per UBC 1997) are furnished in the Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks. Review of the Design Calculations documents of these vessels show that they have adequate strength after consideration of corrosion allowance to withstand the applicable operating pressure, temperature, and seismic loads for the specified design life of the vessels. Furthermore, approval and acceptance of the vendor fabrication drawings by Bechtel National Inc. (BNI) is an added assurance that all applicable requirements stated above and as described in documents (including daughter documents) listed in Material Requisition for the vessels have been met.

	Information Assessed	Source of Information	Assessment
Foundation	Vessel foundation will maintain the load of a full vessel.	Specifications listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-WTP-DB-ENG-01-001, Rev. 1K, Basis of Design. 24590-QL-POB-MVA0-00002-03-01, Rev. 00E, Design Calculations for LOP-VSL-00001; 24590-QL-POB-MVA0-00002-03-02, Rev. 00E, Design Calculations for LOP-VSL-00002.	The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME Section VIII, Division 1 for the design of the vessel supports. This code ensures an adequate design for the vessel supports. Review of the Design Calculations documents of the vessels show that the vessels' support skirts have adequate strength to maintain the loads of full vessel. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the vessel support must be adequate to support the loads from full vessel, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation is part of a separate integrity assessment report for the Secondary Containment of the vessels.
	If in an area subject to flooding, the vessel is anchored.	Specifications and Mechanical Data Sheets listed under References.	Specification for Pressure Vessel Design requires designing the vessel supports and anchors to secure the buoyant vessel in case the vessel is empty and submerged to the level indicated in the Mechanical Data Sheet. The Mechanical Data Sheets for these vessels do not indicate any such conditions; therefore, the flooding consideration does not apply.
	Vessel system will withstand the effects of frost heave.	24590-WTP-DB-ENG-01-001, Rev. 1K, Basis of Design.	The Basis of Design document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. The vessels are located inside/interior of the building at Elev. 2'-0" level, and the building's lower level floor is at Elev. (-) 21'-0", therefore, the vessels' foundations are not subject to frost heave.

	Information Assessed	Source of Information	Assessment
Waste Characteristics	Characteristics of the waste to be stored or treated have been identified (dangerous waste characteristics, specific gravity, vapor pressure, flash point, storage temperature)	Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0002, Rev. 1, LOP-VSL-00001 & LOP-VSL-00002 (LAW) Melter 1 & Melter 2 SBS Condensate Vessel; 24590-WTP-PER-PR-03-002, Rev. 3, Toxic Vapors and Emissions from WTP Tank Systems and Miscellaneous Treatment Unit Systems; 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Unit Systems.	The Mechanical Data Sheets present process conditions and design parameters of the vessels, such as the waste specific gravity, temperatures, and pressures, etc. The Plant Item Material Selection Data Sheet addresses the pH range and chemical composition of the waste and selects appropriate vessel materials and the corrosion allowance. Waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are appropriately addressed in the Toxic Vapors and Emissions document and Prevention of Hydrogen Accumulation document. These two documents do not specifically list these vessels to exhibit any hazardous waste characteristics.
	Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	System Description listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0002, Rev. 1, LOP-VSL-00001 & LOP-VSL-00002 (LAW) Melter 1 & Melter 2 SBS Condensate Vessel.	The Plant Item Material Selection Data Sheet demonstrates that the vessels are designed to process the wastes discussed above. The System Description discusses normal and abnormal operations for the LOP vessels. The solids accumulated in the vessels are suspended by the Eductors (LOP-EDUC-00001/2) powered by a side stream from the recirculation line. The cooled condensate is recycled via purge pumps (LOP-PMP-00001/4) to the SBS column vessels.
	The waste types are compatible with each other.	System Description listed above under References.	The System Description for the LAW (LOP) does not describe any operations where incompatible wastes are mixed in these vessels for processing. These vessels are part of LAW LOP system's purpose of cooling the offgas and removing the aerosols generated by the LAW melters.

Information Assessed		Source of Information	Assessment
Corrosion Protection	Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)	Mechanical Data Sheets and Drawings listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0002, Rev. 1, LOP-VSL-00001 & LOP-VSL-00002 (LAW) Melter 1 & Melter 2 SBS Condensate Vessel;	The Plant Item Material Selection Data Sheet shows that the LAW Submerged Bed Scrubber condensate vessels, LOP-VSL-00001/2 normally operate at a pH range of 3 to 8, 2 psig pressure, and at a nominal temperature of 113°F. The vessels are designed for 15 psig pressure and a temperature of 237°F. Other pertinent vessel operation and design information is provided in the Mechanical Data Sheets. The material selected is C-22 and a corrosion allowance of 0.04 in. is recommended, however, Mechanical Data Sheets require conservative corrosion allowance values of 0.08 in. internal plus 0.01 in. external to be used in the design. The external corrosion allowance is used for shell surface under the jacket. The LOP vessels as shown on drawings are located in the LAW facility cells (L-0123/L-0124) at Elevation 2'-0". Each vessel's support skirt material is 304 stainless steel. Each cell is equipped with a sump pump to remove any leakage. Therefore, the cells should remain dry during normal operations which will limit external corrosion of the vessel over the facility design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the vessel.	Mechanical Data Sheets listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0002, Rev. 1, LOP-VSL-00001 & LOP-VSL-00002 (LAW) Melter 1 & Melter 2 SBS Condensate Vessel.	The bases for the LOP vessel's material selection and corrosion allowance are furnished in the Plant Item Material Selection Data Sheet. Selection of C-22 material for the vessels with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate; however, conservatively, 0.08 in. internal plus 0.01 in. external corrosion allowance values have been used in the design calculations as required in the Mechanical Data Sheets.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.	Drawings and System Description listed above under References.	The LOP Melter 1 and Melter 2 SBS Condensate Vessels, LOP-VSL-00001/2 receive condensate overflow from SBS Column Vessels (LOP-SCB-00001/2) and then continuously pump out the further cooled off condensate back into the SBS, using purge pumps (LOP-PMP-00001/4). All these plant items are located at Elevation 2'-0", as shown on the drawings and described in the System Description document. The vessels are vented via the 2" diameter outlet lines to the SBS Column Vessels (LOP-SCB-00001/2) into the main offgas discharge pipe. These vents prevent the over pressurization of the SBS Condensate Vessels.

	Information Assessed	Source of Information	Assessment
Design	Vessel design standards are appropriate and adequate for the vessel's intended use.	Mechanical Data Sheet, Specifications, and Drawings, listed above under References; ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers. ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 2, Alternate Rules, American Society of Mechanical Engineers.	The Mechanical Data Sheets show that the LOP system Submerged Bed Scrubbers, LOP-SCB-00001/2 and their appurtenances are to be designed to the ASME Section VIII, Division 1 rules which are appropriate for pressure vessels operating with mixed waste solutions over the pressure and temperature ranges specified for these plant items. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure vessel, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the vessel and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. The vessels are subjected to cyclic loading. The Specification for Fatigue Analysis requires the use of ASME Section VIII, Division 2 rules for vessel components with a high number of load cycles. These are adequate and acceptable design standards for the intended use of these SBSs. The drawings show that the LAW Submerged Bed Scrubbers, LOP-SCB-00001/2 are vertical with a 120 in. ID and a height of 78 in. from bottom tangent line to top tangent line. The top and bottom Flanged & Dished (F & D) heads and shell are built with 5/8" thick plate. Each SBS is supported on a cylindrical skirt (1/2" thick plate by approx. 5'-7" high) which in turn is supported on a base plate anchored to the concrete floor at Elev. 2'-0". The SBSs have internal equipment such as coil and scrubber bed supported from the top head. Material for the shell, top and bottom heads, and internal equipment is Hastelloy C-22 (SB-575 N06022) and is hereafter referred to as C-22. The vessel's shell and bottom head has an external cooling coil jacket made of SA-312 304 stainless steel half-pipe section. The supporting skirt is specified as SA-240 304 stainless steel plate (0.030% maximum carbon content) and is hereafter referred to as 304 stainless steel. The operating volume of each vessel is about 3,690 gallons and the total internal volume of each is about 4,950 gallons.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.	Specifications, Drawings, Mechanical Data Sheet, and Material Requisition listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-QL-POA-MKAS-00001-01-03, Rev. 00C, Design Calculations for (LOP-SCB-00001/2); 24590-QL-POA-MKAS-00001-01-16, Rev. 00C, Design Calculations for (LOP-SCB-00001/2); 24590-QL-POA-MKAS-00001-01-17, Rev. 00C, Design Calculations for (LOP-SCB-00001/2); 24590-QL-POA-MKAS-00001-01-18, Rev. 00C, Design Calculations for (LOP-SCB-00001/2).	The LOP Submerged Bed Scrubbers, LOP-SCB-00001/2 are standard ASME Section VIII vessels. The Mechanical Data Sheet requires that the ASME Section VIII, Division 1 plant items be delivered after design, fabrication, inspection, and testing with an ASME code stamp and are nationally registered. These are shop fabricated vessels that will be delivered for service in the LAW Facility. Review of the Design Calculations documents of these vessels show that they have been designed as standard vessels per applicable requirements of ASME Section VIII, Division 1 Code and other documents listed in the Material Requisition for the vessels. The aforementioned statements and the vendor fabrication drawings reviewed demonstrate that sound engineering principles of construction and fabrication have been used for the vessels.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Vessel has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Specifications, Material Requisition, Drawings, and Mechanical Data Sheet listed above under References; ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; UBC 1997, Uniform Building Code, International Conference of Building Officials; 24590-QL-POA-MKAS-00001-01-03, Rev. 00C, Design Calculations for (LOP-SCB-00001/2); 24590-QL-POA-MKAS-00001-01-16, Rev. 00C, Design Calculations for (LOP-SCB-00001/2); 24590-QL-POA-MKAS-00001-01-17, Rev. 00C, Design Calculations for (LOP-SCB-00001/2); 24590-QL-POA-MKAS-00001-01-18, Rev. 00C, Design Calculations for (LOP-SCB-00001/2).	The Mechanical Data Sheet identifies each vessel's operating pressure and temperature ranges, the materials selected for the vessel, the corrosion allowance, the vessel quality level, and its seismic category. The Mechanical Data Sheet also requires that the vessels be designed to ASME Section VIII, Division 1 rules. This code requires specific consideration of the operating pressures, temperatures, seismic loads, and corrosion allowance in the design process. Supplementary design criteria are specified in the Engineering Specifications for Seismic Qualification Criteria and Structural Design Loads for Seismic Category III & IV Equipment and Tanks to provide for the seismic design analysis. The Mechanical Data Sheet identifies the vessels operating pressure and temperature ranges and the requirements for seismic qualification in the design. ASME Section VIII, Div. 1 requires that corrosion allowance thickness shall be excluded from nominal vessel thickness when evaluating the adequacy of vessel components for these loads at end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels provides pertinent requirements for determination of seismic loads, analysis, and acceptance criteria for the vessels and their supports. The Mechanical Data Sheet identifies the vessels' Seismic Category as SC- III. For SC-III vessels, the detailed requirements for seismic load determination (per UBC 1997) are furnished in the Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks. Review of the Design Calculations documents of these vessels show that they have adequate strength after consideration of corrosion allowance to withstand the applicable operating pressure, temperature, and seismic loads for the specified design life of the vessels. Furthermore, approval and acceptance of the vendor fabrication drawings by Bechtel National Inc. (BNI) is an added assurance that all applicable requirements stated above and as described in documents (including daughter documents) listed in Material Requisition for the vessels have been met.

	Information Assessed	Source of Information	Assessment
Foundation	Vessel foundation will maintain the load of a full vessel.	Specifications listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-WTP-DB-ENG-01-001, Rev. 1K, Basis of Design; 24590-QL-POA-MKAS-00001-01-16, Rev. 00C, Design Calculations for (LOP-SCB-00001/2).	The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME Section VIII, Division 1 for the design of the vessel supports. This code ensures an adequate design for the vessel supports. Review of the Design Calculations document of the vessels show that the vessels' support skirts have adequate strength to maintain the loads of full vessel. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the vessel support must be adequate to support the loads from full vessel, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation is part of a separate integrity assessment report for the Secondary Containment of the vessels.
	If in an area subject to flooding, the vessel is anchored.	Specifications and Mechanical Data Sheet listed above under References.	Buoyant forces of an empty vessel in a flooded room if identified in the Mechanical Data Sheet (MDS) are a mandatory standard design load case in the Specification for Pressure Vessel Design and Fabrication. There are no such requirements in the MDS and this requirement does not apply here. However, the buoyant forces have been considered in the calculations.
	Vessel system will withstand the effects of frost heave.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1K, Basis of Design.	The Basis of Design document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. The drawings show that the SBSs are located inside/interior of the building at Elev. 2'-0" level, and the building's lower level floor is at Elev. (-) 21'-0", therefore, the foundations are not subject to frost heave.

	Information Assessed	Source of Information	Assessment
Waste Characteristics	Characteristics of the waste to be stored or treated have been identified (dangerous waste characteristics, specific gravity, vapor pressure, flash point, storage temperature)	Mechanical Data Sheet listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0001, Rev. 1, LOP-SCB-00001/2 (LAW) Melter 1 and Melter 2 Submerged Bed Scrubbers (SBS); 24590-WTP-PER-PR-03-002, Rev. 3, Toxic Vapors and Emissions from WTP Tank Systems and Miscellaneous Treatment Unit Systems; 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Unit Systems.	The Mechanical Data Sheet presents process conditions and design parameters of the vessels, such as the waste specific gravity, storage temperatures and pressures, etc. The Plant Item Material Selection Data Sheet addresses the pH range and chemical composition of the waste and selects appropriate vessel materials and the corrosion allowance. Waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are appropriately addressed in the Toxic Vapors and Emissions document and Prevention of Hydrogen Accumulation document. These two documents do not specifically list these vessels to exhibit any hazardous characteristics. As an added feature, these plant items are grounded to control ignition sources.
	Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	System Description listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0001, Rev. 1, LOP-SCB-00001/2 (LAW) Melter 1 and Melter 2 Submerged Bed Scrubbers (SBS).	The Plant Item Material Selection Data Sheet demonstrates that the vessel is designed to process the wastes discussed above. The System Description discusses normal and abnormal operations for the SBSs. To help remove the solids the re-circulated stream is pumped through 8 lances that agitate the bottom of the SBS column and consolidate the solids near the pump suction.
	The waste types are compatible with each other.	System Description listed above under References.	The System Description for the LAW (LOP) does not describe any operations where incompatible wastes are mixed in the SBSs for processing. These vessels are part of LAW LOP system's purpose of cooling the offgas and removing the aerosols generated by the LAW melters.

	Information Assessed	Source of Information	Assessment
Corrosion Protection	Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)	Drawings and Mechanical Data Sheet listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0001, Rev. 1, LOP-SCB-00001/2 (LAW) Melter 1 and Melter 2 Submerged Bed Scrubbers (SBS).	Pertinent vessel operation and design information is listed in the Plant Item Material Selection Data Sheet and Mechanical Data Sheet documents. These documents show that the LAW Submerged Bed Scrubbers, LOP-SCB-00001/2 normally operate at a pH range of 3 to 8 and at a temperature of about 122°F and at (-) 2.2 to 0 psig and they are designed for full vacuum (FV) and 15 psig pressure and a temperature of 237 °F. The material selected is C-22 and a corrosion allowance of 0.04 in. The SCBs are located in the LAW cells (L-0123/L-0124) at Elevation 2'-0". The vessel's support skirt material is 304 stainless steel. This cell is equipped with a sump to pump out any leaks. Therefore, the cell should remain dry during normal operations which will limit external corrosion of the vessel over the facility design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the vessel.	Mechanical Data Sheet listed above under References; Plant Item Material Selection Data Sheet, 24590-LAW-N1D-LOP-P0001, Rev. 1, LOP-SCB-00001/2 (LAW) Melter 1 and Melter 2 Submerged Bed Scrubbers (SBS).	The bases for the SBSs' material selection and corrosion allowance are furnished in the Plant Item Material Selection Data Sheet. Selection of C-22 and 304 stainless steel materials with a corrosion allowance of 0.04 in. for a service life of 40 years is adequate and appropriate. The material selections and corrosion allowances are carried forward to the Mechanical Data Sheet, consistently and correctly.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.	Drawings and System Description listed above under References.	The LOP Submerged Bed Scrubbers , LOP-SCB-00001/2 are designed for unrestricted continuous liquid overflow through two 4" diameter lines to the SBS Condensate Vessels (LOP-VSL-00001/2) which are also located at Elevation 2'-0", as shown on the drawings and described in the System Description document. The offgas also flows unrestrictedly via the 10" diameter outlet lines to the LAW Wet Electrostatic Precipitators (LOP-WESP-00001/2). The unrestricted liquid overflow and offgas discharge prevent the over pressurization of the Scrubbers.

	Information Assessed	Source of Information	Assessment
Design	Vessel design standards are appropriate and adequate for the vessel's intended use.	Specifications, Drawings, and System Description, listed above under References; ASME Boiler and Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers.	The Engineering Specification for Wet Electrostatic Precipitators (WESPs) requires that the WESPs (LOP-WESP-00001/2) including appurtenances are to be designed to the ASME Section VIII, Division 1 rules which are appropriate for pressure vessels operating with mixed waste solutions over the pressure and temperature ranges specified for these plant items. Supplementary requirements are specified in the Engineering Specification for Pressure Vessel Design and Fabrication. Supplementary requirements address pressure vessel, positive material identification, lifting attachment design, equipment drop evaluation, fabrication tolerances, acceptable welding procedures for the vessel and appurtenances, welder qualifications and testing records, NDE inspections and records, and lifting, packaging, shipping, handling and storage requirements. These are adequate and acceptable design standards for the intended use of these plant items. The Specification for the LAW Wet Electrostatic Precipitators provides the overall dimensions of the vessels and the vendor fabrication drawings show that the LOP-WESP-00001/2 are vertical with a 8'-0" OD and a height of 21'-6" from bottom of skirt base plate to the top. Each vessel's top and bottom Flanged and Dished (F & D) heads are of ellipsoidal shape. The shells are made of 1/2" thick plate and top and bottom head plates are 3/8"thick. Each WESP is supported on a skirt (51" high x 3/8" thick plate) which in turn is supported on a base plate anchored to the concrete floor at Elev. 2'-0". Material specified for the vessels is 6% Molybdenum stainless steel alloy (ASME SB688, UNS-N08367) and is hereafter referred to as 6% Mo. The material for supporting skirt plate is specified as SA-240 304 stainless steel (0.030% maximum carbon content) and is hereafter referred to as 304 stainless steel.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	If a non-standard vessel is to be used, the design calculations demonstrate sound engineering principles of construction.	Specifications, Drawings, and Material Requisition listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-QL-POA-MKE0-00001-07-01, Rev. 00D, Design Calculations for (LOP-WESP-00002); 24590-QL-POA-MKE0-00001-07-02, Rev. 00D, Design Calculations for (LOP-WESP-00001); 24590-QL-POA-MKE0-00001-07-03, Rev. 00H, Design Calculations for (LOP-WESP-00001/2); 24590-QL-POA-MKE0-00001-07-12, Rev. 00A, Design Calculations for (LOP-WESP-00001/2).	The LOP Wet Electrostatic Precipitators, LOP-WESP-00001/2 are standard ASME Section VIII, Division 1 vessels. The Specification for the WESPs requires that the ASME Section VIII, Division 1 plant items be delivered after design, fabrication, inspection and testing with an ASME code stamp and be nationally registered. These are shop fabricated vessels that will be delivered for service in the LAW Facility. Review of the Design Calculations documents of these vessels show that the vessels have been designed as standard vessels per applicable requirements of ASME Section VIII, Division 1 Code and other documents listed in the Material Requisition for the vessels. The aforementioned statements and the vendor fabrication drawings reviewed demonstrate that sound engineering principles of construction and fabrication have been used for the vessels.

	Information Assessed	Source of Information	Assessment
Design (cont'd)	Vessel has adequate strength, after consideration of the corrosion allowance, to withstand the operating pressure, operating temperature, and seismic loads.	Specifications and Drawings listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; UBC 1997, Uniform Building Code, International Conference of Building Officials; 24590-QL-POA-MKE0-00001-07-01, Rev. 00D, Design Calculations for (LOP-WESP-00002); 24590-QL-POA-MKE0-00001-07-02, Rev. 00D, Design Calculations for (LOP-WESP-00001); 24590-QL-POA-MKE0-00001-07-03, Rev. 00H, Design Calculations for (LOP-WESP-00001/2); 24590-QL-POA-MKE0-00001-07-12, Rev. 00A, Design Calculations for (LOP-WESP-00001/2).	The Specification for the WESPs identifies their operating pressure and temperature ranges, the materials selected for the vessel, the corrosion allowance, and the vessel quality level which determines the requirements for seismic design. The specification requires specific consideration of the operating pressures and temperatures and seismic loads in the design process. This specification further requires that vessels be designed to ASME Section VIII, Division 1 rules. This code requires specific consideration of the operating pressures, temperatures, seismic loads, and corrosion allowance in the design process. Supplementary design criteria are specified in the Engineering Specifications for Seismic Qualification Criteria and Structural Design Loads for Seismic Category III & IV Equipment and Tanks to provide for the seismic design analysis. ASME Section VIII, Div. 1 requires that corrosion allowance thickness shall be excluded from nominal vessel thickness when evaluating the adequacy of vessel components for these loads at end of life. The Engineering Specification for Seismic Qualification Criteria for Pressure Vessels provides pertinent requirements for determination of seismic loads, analysis, and acceptance criteria for the vessels and their supports. The Specification for the WESPs design identifies the vessels' Seismic Category as SC- III. For SC-III vessels, the detailed requirements for seismic load determination (per UBC 1997) are furnished in the Specification for Structural Design Loads for Seismic Category III & IV Equipment and Tanks. Review of the Design Calculations documents of these vessels show that they have adequate strength after consideration of corrosion allowance to withstand the applicable operating pressure, temperature, and seismic loads for the specified design life of the vessels. Furthermore, approval and acceptance of the vendor fabrication drawings by Bechtel National Inc. (BNI) is an added assurance that all applicable requirements stated above and as described in documents (including daughter documents) listed in Material Requisition for the vessels have been met.

	Information Assessed	Source of Information	Assessment
Foundation	Vessel foundation will maintain the load of a full vessel.	Specifications listed above under References; ASME Boiler & Pressure Vessel Code (BPV), Section VIII, Division 1, Rules for Construction of Pressure Vessels, American Society of Mechanical Engineers; 24590-WTP-DB-ENG-01-001, Rev. 1K, Basis of Design; 24590-QL-POA-MKE0-00001-07-03, Rev. 00H, Design Calculations for (LOP-WESP-00001/2).	The Engineering Specification for Pressure Vessel Design and Fabrication requires the use of ASME BPV Code, Section VIII, Division 1, for the design of the WESP supports. This code ensures an adequate design for the WESP supports. Review of the Design Calculations document of the vessels show that their support skirts have adequate strength to maintain the loads of full vessel. Furthermore, Chapter 14 of the Basis of Design document requires that the foundation underlying the vessel support must be adequate to support the loads from full vessel, which is out of scope of this assessment. The assessment of the adequacy of the underlying foundation is part of a separate integrity assessment report for the Secondary Containment of the vessels.
	If in an area subject to flooding, the vessel is anchored.	Specifications listed above under References; 24590-LAW-PER-M-02-002, Rev. 6, Flooding Volume for LAW Facility; 24590-QL-POA-MKE0-00001-07-03, Rev. 00H, Design Calculations for (LOP-WESP-00001/2).	Buoyant forces consideration on an empty vessel in a flooded room if identified in the design media, is a mandatory standard design load case requirement in the Specification for Pressure Vessel Design and Fabrication. No design document identifies these vessels to be fully submerged under water. The Flooding Volume document for LAW facility shows that the process cells (Rooms L-0123 and L-0124) are constructed with steel liner plate up to 2'-0" height which is anticipated as the maximum design flood height. However, the Design Calculations document shows that the buoyant forces on anchors were conservatively computed by considering a case of fully submerged empty vessels.
	Vessel system will withstand the effects of frost heave.	Drawings listed above under References; 24590-WTP-DB-ENG-01-001, Rev. 1K, Basis of Design.	The Basis of Design document requires that all structural foundations for outdoor equipment to extend a distance below grade that exceeds the 30" depth of the frost line. The drawings show that the WESPs are located inside/interior of the building at Elev. 2'-0" level, and the building's lower level floor is at Elev. (-) 21'-0", therefore, the foundations are not subject to frost heave.

	Information Assessed	Source of Information	Assessment
Waste Characteristics	Characteristics of the waste to be stored or treated have been identified (dangerous waste characteristics, specific gravity, vapor pressure, flash point, storage temperature)	Specification listed above under References; 24590-LAW-N1D-LOP-00003, Rev. 3, Corrosion Evaluation, LOP-WESP-00001 & LOP-WESP-00002 (LAW), Melter 1 and Melter 2 Wet Electrostatic (WESP); 24590-WTP-PER-PR-03-002, Rev. 3, Toxic Vapors and Emissions from WTP Tank Systems and Miscellaneous Treatment Unit Systems; 24590-WTP-PER-PR-03-001, Rev. 1, Prevention of Hydrogen Accumulation in WTP Tank Systems and Miscellaneous Treatment Unit Systems.	The Specification for WESPs and their Corrosion Evaluation document present the temperatures, pressures, and chemical composition, select appropriate materials, and specify the corrosion allowance. Waste characteristics that are hazardous, such as ignitability, reactivity, and toxicity are appropriately addressed in the Toxic Vapors and Emissions document and Prevention of Hydrogen Accumulation document. These two documents do not specifically list these vessels to exhibit any hazardous characteristics. As an added feature, these plant items are grounded to control ignition sources.
	Vessel is designed to store or treat the wastes with the characteristics defined above and any treatment reagents.	System Description listed above under References; 24590-LAW-N1D-LOP-00003, Rev. 3, Corrosion Evaluation, LOP-WESP-00001 & LOP-WESP-00002 (LAW), Melter 1 and Melter 2 Wet Electrostatic (WESP).	The Corrosion Evaluation document demonstrates that the vessel is designed to process the wastes discussed above. The System Description discusses normal and abnormal operations for the WESPs. Demineralized water will be used for flushing/rinsing or wash downs of the vessels.
	The waste types are compatible with each other.	System Description listed above under References.	The System Description for the LAW (LOP) does not describe any operations where incompatible wastes are mixed in the WESPs for processing. These vessels are part of LAW LOP system's purpose of cooling the offgas and removing the aerosols generated by the LAW melters.

	Information Assessed	Source of Information	Assessment
Corrosion Protection	Vessel material and protective coatings ensure the vessel structure is adequately protected from the corrosive effects of the waste stream and external environments (expected to not leak or fail for the design life of the system)	Drawings and Specifications listed above under References; 24590-LAW-N1D-LOP-00003, Rev. 3, Corrosion Evaluation, LOP-WESP-00001 & LOP-WESP-00002 (LAW), Melter 1 and Melter 2 Wet Electrostatic (WESP).	The Engineering Specification for WESPs and Corrosion Evaluation document show that the WESPs (LOP-WESP-00001/2) normally operate at a pH range of 0.71 to 1.57 and at a temperature of 121°F (+/- 15°F). They are designed for a range of (+1) atmospheric to (-1) atmospheric pressure and for 170°F temperature. The material selected is 6% Mo alloy and a corrosion allowance of 0.04 in. The WESPs are located in the LAW cells (L-0123/L-0124) at Elevation 2'-0". The WESPs' support skirt material is 304 stainless steel. Each cell is equipped with a sump to pump out any leaks. Therefore, the cell should remain dry during normal operations which will limit external corrosion of the vessel over the facility design life.
Corrosion Allowance	Corrosion allowance is adequate for the intended service life of the vessel.	Specification listed above under References; 24590-LAW-N1D-LOP-00003, Rev. 3, Corrosion Evaluation, LOP-WESP-00001 & LOP-WESP-00002 (LAW), Melter 1 and Melter 2 Wet Electrostatic (WESP).	The material selection and corrosion allowance are furnished in the Corrosion Evaluation document and Specification for WESPs. Selection of 6% Mo alloy with a corrosion allowance of 0.04 in. for a service life of 40 years, appear to be adequate and appropriate.
Pressure Relief	Pressure controls (vents and relief valves) are adequately designed to ensure pressure relief if normal operating pressures in the vessel are exceeded.	Drawings and System Description listed above under References.	The LOP Wet Electrostatic Precipitators , LOP-WESP-00001/2 are inline vessels designed for unrestricted upward continuous flow of offgas to the HEPA pre-heaters for further processing and for the unrestricted condensate gravity flow down into the C3/C5 drain/sump collection vessel (RLD-VSL-00004), as shown on the drawings and described in the System Description document.